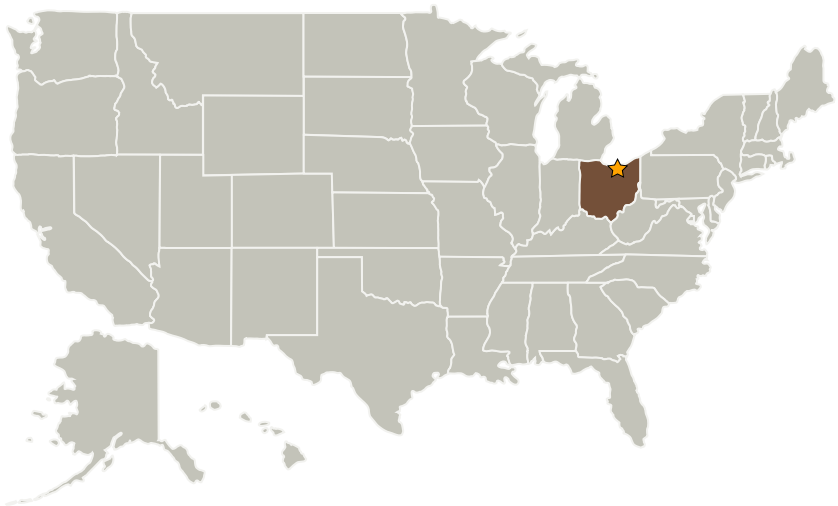
Space Based Ka Band Radio

Completed Technology Project (2018 - 2018)

Project Introduction

ViaSat is creating the next generation ultra-high throughput satellite service that will create new possibilities for terrestrial, airborne and low earth orbit users. ViaSat seeks to collaborate with NASA Glenn Research Center (GRC) on the development of a space-based Ka-band radio that will interoperate with ViaSat's next generation communication service and the TDRSS network and potentially NASA's Near Earth Network (NEN). Currently TDRS and ViaSat-3 operate in different portions of the Ka-band and next generation communication system terminals require more processing on a tighter power budget than traditional rad-hard parts can deliver. We believe there is value creating a space user terminal with compatibility between the NASA TDRSS network and ViaSat's next-generation network. This next generation space radio platform will enable higher data rates and total data return along with access to entire constellations of LEO satellites; thereby reducing latency, allowing on demand access, minimizing resource contention, and increasing resiliency. Additionally, this proposed dual use Ka-band space radio capability scales to economically service missions that have traditionally relied on the Near Earth Network for direct-to-ground data return. Together, NASA and ViaSat can bring a higher performing and more resilient capability to NASA's LEO mission needs at lower cost. Areas of collaboration to ensure future growth include: • Determine processing power requirements for a space radio that supports both NASA's implementation of DVB-S2 and ViaSat'swaveforms. • Identify, test, and characterize key commercial/industrial parts candidates (FPGAs, ASICs, MIMICs and CPUs) required to create a common space capable radio. • Determine how NASA data protocols (e.g. CCSDS and DTN/BP) can be used in conjunction with IP protocols on commercial networks.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Game Changing Development

Game Changing Development

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations
Ohio

Project Management

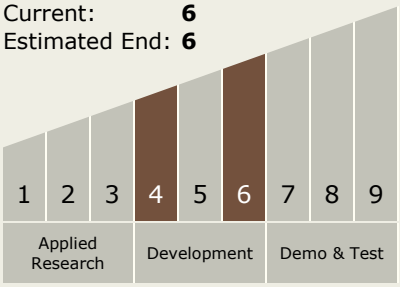
Program Director:
Mary J Werkheiser

Program Manager:
Gary F Meyering

Principal Investigator:
Melanie N Ott

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Target Destination

Earth